UNIVERSITY OF DEBRECEN
Faculty of the Agricultural and Food Sciences and Environmental Management

DEBRECEN, HUNGARY

Food Safety and Quality MSc
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About Debrecen

With 205,000 inhabitants Debrecen is the second largest city in Hungary and the center of the North Great Plain Region. The Eastern gate of Europe, as Debrecen is often referred to, is also the seat of Hungarian Protestantism, and as such is often called the "Calvinist Rome". The numerous university faculties, colleges and professional schools have turned Debrecen into the country's most important educational center. More recently, the city's main focus is the development of its industrial park, and centers for knowledge management in information technology, nanotechnology, pharmacy and biotechnology.

Summer is the time of festivals: thousands of people from other parts of Hungary as well as from abroad visit the famous Debrecen Flower Carnival, the Debrecen Jazz Days, the Béla Bartók International Choir Competition and the International Military Band Festival. The new Conference Center hosts professional and cultural programs. Week by week, many people support the city's most famous sport clubs, especially the football, handball and basketball teams. Those wishing to take a rest are welcome in the Great Forest, where the famous Debrecen Spa Bath and the Mediterranean Aquaticum are located.

Higher education in Debrecen

The history of Debrecen's higher education dates back to the 16th century. The Calvinist Reformed College, established in 1538, played a central role in education, teaching in the native language and spreading Hungarian culture in the region as well as in the whole country. The College was a sound base for the Hungarian Royal University, founded in 1912. Apart from the three academic faculties (arts, law, theology) a new faculty, the faculty of medicine was established, and the University soon became one of the regional citadels of Hungarian higher education.

Today the University of Debrecen is classified as a “University of National Excellence” and offers the highest number of academic programs in the country, hence it is one of the best universities in Hungary. Its reputation is a result of its quality training, research activities and the numerous training programs in different fields of science and engineering in English.

With 14 faculties and a student body of almost 30,000, of which about 3700 are international students, the University of Debrecen is one of the largest institutions of higher education in Hungary.
DEAN’S WELCOME

Thank you for your interest in our university with a great past and in our agricultural higher education with approximately 150 year old traditions.

The University of Debrecen is one of the institutions offering a wide range of courses and research activities in Hungary. As one of the most significant think tanks in the country and the knowledge centre of the region, we seek to provide unprecedented opportunities for our students to gain state-of-the-art knowledge and to carry out significant activities.

With excellent infrastructure and high level education, the Faculty of Agricultural and Food Sciences and Environmental Management ensures excellent facilities for its students. In addition to gaining in-depth modern experience, a wide range of opportunities are available to perform professional and scientific activities beyond the scope of academic studies. After obtaining their certificates in higher education vocational training and BSc diploma courses, our students acquire a thorough practical knowledge, they can continue their studies in MSc training and then the best ones in Ph.D. training.

We firmly believe that the variety of trainings and courses we offer are attractive to many students who choose the Faculty of Agricultural and Food Sciences and Environmental Management for academic education.

I wish you every success in your studies and hope to meet you personally in the near future.
THE ORGANIZATIONAL STRUCTURE OF THE UNIVERSITY

RECTOR OF THE UNIVERSITY OF DEBRECEN

Rector      Zoltán Szilvássy M.D., Ph.D, D.Sc.
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FACULTY OF AGRICULTURAL AND FOOD SCIENCES AND ENVIRONMENTAL MANAGEMENT

Dean       Prof. Dr. habil. István Komlósi
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REGISTRAR’S OFFICE

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Officer  Mrs. Gizella Kerekes Guthy
Officer  Mrs. Mónika Bátori Pintye
Officer  Zsuzsanna Házi
Officer  László Lévai
THE DEPARTMENTS OF THE FACULTY

Institute of Agricultural Chemistry and Soil Science

Head of the Institute: Prof. Dr. habil. János Kátai

Associate professor:
Dr. habil. Imre Vágó
Dr. Andrea Balláné Kovács
Dr. Mária Dr. Micskeiné Csubák

Assistant professor:
Dr. Sándorné Kincses
Dr. Rita Erdeiné Kremper
Dr. Zsolt Sándor

Research assistant:
Dr. Magdolna Tállai

Secretary
Gizella Szász

Institute of Animal Science, Biotechnology and Nature Conservation

Department of Animal Husbandry

Head of the Department: Prof. Dr. István Komlósi

Professor emeritus: Dr. Sándor Mihók

Associate professor:
Dr. Béla Béri
Dr. László Stündl
Dr. Gabriella Novotniné Dankó
Dr. József Prokisch
Dr. Károly Magyar
Assistant professor
Dr. János Posta
Dr. Levente Czeglédi
Dr. Péter Bársony
Dr. Anna Pécsi
Assistant lecturer:
Dr. Nóra Dr. Pálffyné Vass
Technical assistant:
Babka Beáta
Sztrik Attila
Gulyás Gabriella
Secretary:
Károlyné Kiss
Marianna Korcsmárosné Varga
Ágnes Gere
Anikó Nagy
Sándor Boros

Department of Nature Conservation, Zoology and Game Management

Head of the Department: Dr. habil. Lajos Juhász
Professor:
Dr. Károly Rédei
Assistant professor:
Dr. Lajos Kozák
Dr. László Szendrei
Dr. Péter Gyüre

Assistant research fellow:
Dr. László Kövér

Technical assistant
Norbert Tóth

**Department of Animal Nutrition and Food Biotechnology**

Head of the Department: Prof. Dr. László Babinszky

Associate professor:
Dr. Csaba Szabó

Senior lecturer.
Dr. Judit Dr. Gálné Remenyik

**Animal Genetics Laboratory**

Head of the Department: Prof. Dr. András Jávor

Professor: Dr. András Kovács

Senior research fellow: Dr. Szilvia Kusza

Assistant lecturer: Zsófia Dr. Rózsáné Dr. Várszegi

**Institute of Food Science**

Head of the Institute: Prof. Dr. Béla Róbert Kovács

Professor:
Dr. Béla Róbert Kovács

Dr. János Csapó

Associate professor:
Dr. Erzsébet Karaffa
Dr. Péter Sipos
Assistant professor:
Dr. Ferenc Árpád Peles
Dr. Nikolett Czipa
Assistant lecturer:
Dr. Diána Ungai
Technical assistant:
Andrea Tóthné Bogárdi
Éva Bacskainé Bódi
Secretary:
Tünde Simon

**Institute for Land Utilisation, Technology and Regional Development**

Head of the Institute: Dr. János Nagy, DSc

Professor:
Dr. Béla Baranyi, DSc
Dr. Gyula Horváth

Associate professor:
Dr. Zoltán Hagymássy
Dr. Endre Harsányi
Dr. Tamás Rátonyi

Assistant professor:
Dr. Adrienn Széles
Dr. András Vántus
Dr. Andorkó Imre

Senior research fellow:
Dr. Attila Csaba Dobos

Secretary:
Zsuzsanna Dorogi
Sándorné Széles

**Institute of Horticulture**

Head of the Institute: Prof. Dr. habil. Imre Holb
Associate professor: Dr. habil Mária Takácsné Hájos
Assistant professor: Dr. Nándor Rakonzás
Assistant lecturer:
Péter Dremák
Ádám Csihon

Assistant research fellow:
Ferenc Abonyi

Secretary: Andrea Gátiné Laskai

**Institute of Crop Sciences**

**Department of Plant Biotechnology**

Professor: Prof. Dr. Miklós Gábor Fári
Associate professor: Dr. Szilvia Veres
Assistant professor:
Dr. Péter Makleit
Dr. Zsuzsanna Lisztes-Szabó
Dr. Éva Domokosné Szabolcsy
Assistant lecturer: 
Szilvia Kovács
Dr. Brigitta Tóth

Department of Landscape Ecology

Head of the Institute: Prof. Dr. Péter Pepó
Associate professor: Dr. József Csajbók
Assistant professor:
Dr. Erika Kurasy
Dr. Lajos Fülöp Dóka
Dr. András Szabó
Assistant lecturer:
Dr. Enikő Vári
Adrienn Novák
Secretary:
Endréné Szendrei
Gyöngyi Kovács
Dr. Pál Pepó
Dr. Szilárd Zsolt Tóth

Institute of Plant Protection

Head of the Institute: Dr. habil. György Kövics
Associate professor:
Dr. László Radócz
Dr. András Bozsik
Assistant professor:

Dr. Antal Nagy

Senior research fellow:

Dr. Gábor Tarcali

Secretary: Tünde Szabóné Asbolt

**Agricultural Laboratory Centre:**

Associate professor:

Dr. Habil. Tünde Pusztahelyi

Assistant research fellow:

Nóra Öri

Technical Assistant:

Mrs. Nóra Bessenyei Tarpay

Mrs. Gábor Tóth

Hajnalka Pákozdy

Mrs. István Sőrés

Csaba Kiss

**Institute of Water and Environmental Management**

Head of the Institute: Prof. Dr. Habil János Tamás

Deputy Head of the Institute: Dr. Habil Csaba Juhász

Professor:

Dr. János Tamás

Dr. Lajos Blaskó

Associate professor:

Dr. Csaba Juhász
Dr. Elza Kovács
Assistant professor:
Dr. Attila Nagy
Dr. Csaba Pregun
Assistant lecturer:
Dr. Lili Mézes
Dr. Tünde Fórián
Dr. Ildikó Gombosné Nagy
Assistant research fellow:
Nikolett Szöllősi
Péter Riczu
Technical assistant:
Katalin Bökfi
András Kaszás Tóth
Kamilla Berényi-Katona
Secretary:
Zsuzsanna Szathmáriné Pongor
Lászlóné Huszka Imre
## UNIVERSITY CALENDAR

**Academic year 2015/2016**

<table>
<thead>
<tr>
<th>academic year</th>
<th>course/time</th>
<th>examination period</th>
</tr>
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<tbody>
<tr>
<td>Registration week</td>
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<tr>
<td><strong>BSc</strong></td>
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<tr>
<td>1st semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st year</td>
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<tr>
<td>2nd year</td>
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<tr>
<td>3rd year</td>
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<td></td>
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<tr>
<td>2nd semester</td>
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<td></td>
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<tr>
<td>1st year</td>
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<td></td>
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<tr>
<td>2nd year</td>
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<tr>
<td>3rd year</td>
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<td></td>
</tr>
<tr>
<td>practise period</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MSc</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st semester</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st year</td>
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<td>2nd semester</td>
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<tr>
<td>1st year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd year</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FOOD SAFETY AND QUALITY MSc PROGRAMME

About the course:
The MSc in Food Safety and Quality is designed to develop your undergraduate knowledge and improve it through application and research. The field of Food Science is broad and the programme reflects this diversity, with emphasis on Raw Material Qualifying, Processing Technology, Quality Analysis and Quality Assurance.

Requirements:
Application requirements: BSc degree or higher in Food Engineering, Chemical Engineering, Biological Science, Agronomy. BSc degree or higher in a chemically and biologically related degree. Other approved accreditation or professional qualification. Upper-intermediate English language certificate.

Length of the Study programme: Two year full-time taught programme plus dissertation. Presently no part-time options are available.

Number of ECTS credits: 120

The course consists of lectures and seminars. Attendance at lectures is recommended, but not compulsory. Participation at practice classes is compulsory. A student must attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. A student can’t make up a practice class with another group. The attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, being discussed with the tutor. Active participation is evaluated by the teacher in every class. If a student’s behavior or conduct doesn’t meet the requirements of active participation,
the teacher may evaluate his/her participation as an absence because of the lack of active participation in class.

The knowledge of the students will be tested several times depending on the class types during the entire course. The training ends in a Final Exam (FE) of the whole semester material and a minimum of four FE dates will be set during the examination period. Unsuccessful students may repeat.

During the semester there are two tests: the mid-term test in the 8th week and the end-term test in the 15th week. Students have to sit for the tests.

Tests are evaluated according to the followings:

<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-59</td>
<td>fail (1)</td>
</tr>
<tr>
<td>60-69</td>
<td>pass (2)</td>
</tr>
<tr>
<td>70-79</td>
<td>satisfactory (3)</td>
</tr>
<tr>
<td>80-89</td>
<td>good (4)</td>
</tr>
<tr>
<td>90-100</td>
<td>excellent (5)</td>
</tr>
</tbody>
</table>

absence for any reason counts as 0%.

If the score of any test is below 60, the student can take a retake test in conformity with the EDUCATION AND EXAMINATION RULES AND REGULATIONS.

An offered grade: It may be offered for the students if the average of the mid-term and end-term tests is at least good (4). The offered grade is the average of them.

**Careers:**

Postgraduates may progress to PhD or find employment in food and dietetics science research, lecturing, consultancy or other science-based sectors of the food science industry. Our institute has a good relationship with food processing and qualifying enterprises and government organizations of the region.
# CURRICULUM OF THE FULL TIME PROGRAMME

<table>
<thead>
<tr>
<th>Courses</th>
<th>Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Semester I</td>
</tr>
<tr>
<td></td>
<td>lec.</td>
</tr>
<tr>
<td>Theory of measuring and experimental designs</td>
<td>2</td>
</tr>
<tr>
<td>Modern methods of food analysis I (Spectroscopy)</td>
<td>1</td>
</tr>
<tr>
<td>Nutritional Sciences</td>
<td>1</td>
</tr>
<tr>
<td>Regulation of food production quality and safety</td>
<td>2</td>
</tr>
<tr>
<td>Expectations to foodstuffs, consumer protection</td>
<td>1</td>
</tr>
<tr>
<td>Molecular biology</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

<p>|                                                      | Semester II   |
|                                                      | lec. | pr | ex | cr |
| Modern Methods of food analysis (Separation technics)| 1    | 4  | P  | 5  |
| Microbiological aspects of food quality and safety   | 2    | 2  | C  | 4  |
| Quality and safety in food technologies              | 2    | 2  | C  | 4  |</p>
<table>
<thead>
<tr>
<th>Courses</th>
<th>Contact Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Semester I</td>
</tr>
<tr>
<td></td>
<td>lec.</td>
</tr>
<tr>
<td>Marketing, Accounting and Finance</td>
<td>2</td>
</tr>
<tr>
<td>Environmental aspects of food processing</td>
<td>3</td>
</tr>
<tr>
<td>Ethical and legal issues of biotechnology</td>
<td>2</td>
</tr>
<tr>
<td>Food toxicology</td>
<td>3</td>
</tr>
<tr>
<td>Quality assurance of measurement</td>
<td>2</td>
</tr>
<tr>
<td>Total:</td>
<td>17</td>
</tr>
<tr>
<td>Hyphenated analytical methods</td>
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</tr>
<tr>
<td>Quality control, quality management</td>
<td>3</td>
</tr>
<tr>
<td>Analytical and microbiological rapid methods</td>
<td>1</td>
</tr>
<tr>
<td>Food quality and safety risk analysis</td>
<td>2</td>
</tr>
<tr>
<td>Innovation management</td>
<td>2</td>
</tr>
<tr>
<td>Quality management systems</td>
<td>3</td>
</tr>
<tr>
<td>Rheology in food testing</td>
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<tr>
<td>Total:</td>
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<tr>
<td>Traceability in the food chain</td>
<td>2</td>
</tr>
<tr>
<td>Food industry management and economics</td>
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</tr>
<tr>
<td>Quality system audit</td>
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<tr>
<td>Logistics in food chain</td>
<td>2</td>
</tr>
<tr>
<td>Total:</td>
<td>10</td>
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<tr>
<td>Optional courses</td>
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<tr>
<td>Packaging technology</td>
<td>2</td>
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<tr>
<td>Healthy nutrition</td>
<td>1</td>
</tr>
<tr>
<td>Extension knowledge</td>
<td>3</td>
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<tr>
<td>Medicinal plants and their processing</td>
<td>1</td>
</tr>
<tr>
<td>Comparative human and animal nutrition</td>
<td>2</td>
</tr>
<tr>
<td>Quality control of biological bases</td>
<td>2</td>
</tr>
<tr>
<td>Courses</td>
<td>Contact Hours</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>Semester I</td>
</tr>
<tr>
<td></td>
<td>lec. pr. ex. cr</td>
</tr>
<tr>
<td>Biochemical bases of product quality</td>
<td>2 0 C 2</td>
</tr>
<tr>
<td>Biosensors in food analysis</td>
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<tr>
<td>Food safety assessment of agrochemicals</td>
<td></td>
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<tr>
<td>Quality evaluation of food proteins</td>
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<tr>
<td>* 6 credits are compulsory</td>
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<tr>
<td>Dissertation</td>
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<tr>
<td>Dissertation I</td>
<td>0 2 P 5</td>
</tr>
<tr>
<td>Dissertation II</td>
<td>0 4 P 10</td>
</tr>
<tr>
<td>Dissertation III</td>
<td>0 6 P 15</td>
</tr>
<tr>
<td>Total</td>
<td>0 0 0 2 5 0 4 10 0 6 15</td>
</tr>
<tr>
<td>Credits for compulsory subjects</td>
<td>27 28 20 11</td>
</tr>
<tr>
<td>Credits for optional subjects</td>
<td>0 0 4 2</td>
</tr>
<tr>
<td>Dissertation</td>
<td>0 5 10 15</td>
</tr>
<tr>
<td>Total credit</td>
<td>27 27 30+4 26+2</td>
</tr>
<tr>
<td>Number of lessons</td>
<td>435 375 360 330</td>
</tr>
</tbody>
</table>
COURSE DESCRIPTIONS

Theory of measuring and experimental designs

Number of classes/week: 2+2T, 1. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 5

Course instructor: Dr. Péter Sipos, associate professor

Short course description:

The aim of the course is to provide an understanding of the principles of experimentation through studying various techniques of designing and analysing statistical experiments and surveys in application to biometrics. On completing this course students will: Understand the notion and requirements of a statistical experiment; Be able to develop a simple design of an experiment and analyse the following types of experimental design: Completely randomized; Randomised complete block; Latin square; Factorial experiments (including some elementary fractional factorials). Be able to select a suitable multiple comparison method and perform the formal statistical analysis. Design and test contrasts between factors of an experiment; Understand the basic concepts of sampling and survey; Have a good knowledge of various types of sampling procedures associated with biometrical problems. In practical sessions, examples and problems from many real-world applications will be used to gain an indepth knowledge of statistical techniques as well as the working knowledge of peculiarities of the data analysis.

Compulsory/ Recommended literature, readings (in English):

Modern methods of analysis I. (Spectroscopy)

Number of classes/week: 1+4T, 1. semester
(form of exam: T – terminal exam, P – assessed by semester performance)
Course credits: 5
Course instructor: Prof. Dr. Béla Kovács, professor

Condition of enrolment for the course: For the enrolment of the subject, mainly chemistry, furthermore physical knowledge is required.

Short course description:

Compulsory/ Recommended literature, readings (in English):


Modern methods of analysis II (Separation technics)

Number of classes/week: 1+4 T, 2. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 5

Course instructor: Dr. János Csapó, professor

Condition of enrolment for the course: Basic chemistry, and analytical chemistry knowledge is required.

Short course description:

Traditional and modern analytical methods are discussed in the respect of practical execution. Practical knowledge is provided in fluid-fluid and solid-fluid extraction as a part of clean-up processes. The course provides understanding in thin-layer-, column- gas- and liquid chromatography, and their role in food analysis. The acquired theoretical knowledge is enforced in laboratory practice.

Compulsory/ Recommended literature, readings (in English):

Nutritional Sciences

Number of classes/week: 2+1, P
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 3

Course instructor: Dr. Rita Erdeiné Kremper, assistant professor

Condition of enrolment for the course: Basic chemistry, biology, physiology

Short course description:

Fundamentals. Lectures examine the structures, properties and metabolism of four major classes of bio-organics (carbohydrates, lipids, proteins/amino acids, nucleic acids/nucleotides) with special attention to their biologic roles and nutritional aspects of their metabolism, vitamins, minerals and other food sources; digestion; factors influencing bioavailability; absorption; transport; tissue uptake and distribution; food additives, the effects of foods from genetic modification, traditional and organic production.

Compulsory/Recommended literature, readings (in English):


CD with course material
Quality and safety in food technologies

Number of classes/week: 2+2T, 2. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 4

Course instructor: Dr. Nikolett Czipa, assistant professor

Condition of enrolment for the course:

Factors determining the production of safety food. Requirements and regulations regarding safety of plant originated raw materials of food. Quality assurance systems in plant production: HACCP, GAP, ISO.

Food safety regulations in grain processing (mill, hulling mill, extruder), baking and oil producing industry, in froot and vegetable production.

Requirements and regulations regarding safety of animal originated raw materials of food.

Feed production, meat- and poultry processing, milk and preserving industry. Safety problems of storage and transport. Public supply and catering.

Compulsory/Recommended literature, readings (in English):

Food Safety and Food Quality, R E Hester (Editor), R M Harrison (Editor)
ISBN: 978-0-85404-270-8

Hygiene in food processing: Principles and practice Edited by H Lelieveld, I T Moster, B White and J Holah
Marketing, accounting and finance

Number of classes/week: 2+2T, 2. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 4

Course instructor: Dr. Zoltán Szakály, associate professor

Description of knowledge this subject offers:

Compulsory/ Recommended literature, readings (in English):


**Food toxicology**

Number of classes/week: 3+0T, 2. semester,

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 4

Course instructor: Dr. József Prokisch, associate professor

**Short course description:**

This course meets the following Overarching Learning Goals for the Food Safety Certificate:

1) Effectively analyze, synthesize and evaluate food safety data.

2) Design and assess food safety assurance strategies, especially regarding their effectiveness within food-related industries.

3) Communicate professionally about food safety.

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**Compulsory/ Recommended literature, readings (in English):**

4. Nutritional Toxicology Second Edition by Frank Kotsonis and Maureen Mackey
Microbiological aspects of food quality and safety

Number of classes/week: 2+2T, 2. semester
(form of exam: T – terminal exam, P – assessed by semester performance)
Course credits: 4
Course instructor: Dr. Erzsébet Karaffa, associate professor

Condition of enrolment for the course: -

Short course description:
Offering recent general and particular knowledge on chemical and biological components of food, main conservation processes, microorganisms as deteriorating agents and the caused illness, demands of Good Manufacturing Practice, and criteria of food-qualification.

Compulsory literature, readings (in English):

Recommended literature:
Quality control, quality management

Number of classes/week: 3+0, 3T. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 3

Course instructor: Dr. Tünde Pusztahelyi, associate professor; Dr. Ferenc Peles, assistant professor

Condition of enrolment for the course:

Short course description:


Compulsory/Recommended literature, readings (in English):

The management and control of quality / Evans – Lindsay. West Publishing Company 1993


James R. Evans - William M. Lindsay: Managing for Quality and Performance Excellence 2004
Quality system audit

Number of classes/week: 2+1T, 4. semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 3

Course instructor: Dr. Ferenc Peles, assistant professor

Condition of enrolment for the course:

Short course description:

Audit program: objectives and extend; responsibilities, resources and procedures; implementation; records; monitoring and reviewing.

Initiating the audit; conducting document review; on-site audit activities; managing the audit report; completing the audit; conducting an audit follow-up.

Competence and evaluation of auditors.

Compulsory/Recommended literature, readings (in English):
ISO 9001:2008 - Quality management systems. Requirements
ISO 19011:2011 – Guidelines for auditing management systems
Regulation of food production, quality and safety

Number of classes/week: 2+2T, 1. semester
(form of exam: T – terminal exam, P – assessed by semester performance)
Course credits: 5
Course instructor: Dr. Imre Andorkó, assistant professor

Condition of enrolment for the course:

Short course description:

General Food Law: general principles; transparency; obligations of food trade; food and feed safety requirements; traceability; European Food Safety Authority; Rapid Alert System, crisis management and emergencies.
Hazard Analysis and Critical Control Points.
Good Agricultural and Environmental Condition, Good Farming Practice.

Compulsory/ Recommended literature, readings (in English):

Codex Alimentarius Hungaricus
IFS/BRC/EFSIS standards
**Expectations to foodstuffs, consumer protection**

Number of classe/week: 1+0P, 1. semester

(form of exam:P-assessed by semester performance)

Course credits: 2

Course instructor: Dr. Nikolett Czipa, assistant professor

Condition of enrolment for the course: Knowledge in Nutrition

**Short course description:**


**Compulsory/ Recommended literature, readings (in English):**


Innovation management

Number of classes/week: 2+0 T, 3th semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 2

Course instructor: Prof. Dr. András Nábrádi, professor

Condition of enrolment for the course: -

Short course description: Determination of innovation, the elements of innovation chain. Type of innovational organizations: establishment of spin-off and start-up enterprise. Personal, and technical conditions of the innovation flow. Realization part of innovation, ongoing development and controling system. Efficiency of the innovation, measurement of the innovation’s profitability. Innovation agencies, general support for innovative actions.

Compulsory/ Recommended literature, readings (in English):


Quality management systems

Number of classes/week: 3+0T, 3. semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 4

Course instructor: Dr. Ferenc Peles, assistant professor

Condition of enrolment for the course:

Short course description:

Model of Good Manufacturing Practice.
Characteristics of quality management systems. Total quality management.
Measurement of excellence, European Quality Award.

Compulsory/Recommended literature, readings (in English):

ISO 9004:2009 – Managing for the sustained success of an organization - A quality management approach


European Quality Award

Quality assurance of measurements

Number of classes/week: 2+0T, 2. semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 2

Course instructor: Dr. Diána Ungai, assistant lecturer

Short course description:

This course provides general principles of the quality assurance in the chemical analytical measurements. Increasing laboratory data quality and meeting user needs are present and futuristic goals. Quality assurance of measurements is a key factor for technical and business success. Providers and users of laboratory data need to be concerned about quality assurance. Proper application of quality assurance principles can help solve or prevent problems.

The course content includes: glossary/acronyms, benefits/costs of quality assurance, basics of quality assurance, staff training, auditing, sampling, archives, holding times, preservatives, instrument performance, calibration, blanks, matrix spike, compound identification, interferences, system performance, reporting data, basic statistics, control charting, standard methods, how to establish a quality assurance program, Good Laboratory Practices (GLP), and Good Automated Laboratory Practices (GALP), quality assurance guidelines.

Compulsory/Recommended literature, readings (in English):

Hyphenated analytical methods

Number of classes/week: 1+1T, 3. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 3

Course instructor: Prof. Dr. Béla Róbert Kovács, professor

Condition of enrolment for the course: Spectroscopy methods subject is required.

Short course description:

Separation and detection methods, moreover advantages and disadvantages of attached analytical systems for speciation of different elements (As, Se, Hg, Cr, Sn, Sb). Separation and detection methods for analysis of various organic components. Sampling and sample preparation methods for speciation analyses. Introduction and detection methods of arsenic, selenium, mercury, tin, lead and other species. Laboratory practice in the above fields.

Compulsory/ Recommended literature, readings (in English):


Rheology in food testing

Number of classes/week: 1+1P, 3. semester
(form of exam: T – terminal exam, P – passessed by semester performance)

Course credits: 2

Course instructor: Dr. Péter Sípos, associate professor

Condition of enrolment for the course: -

Short course description:

Disciple of rheological testing, and their physical-mechanical basics (hydrodynamics, fluid models). Role of rheological testing in the international product qualification and analysis. Rheologic methods in the pasta, baking, milk and purée industries. Application of rheologic tests in other fields.

Examinations in practice: dough testing by Farinograph, Alveograph and Extensograph. Texture analysis by TA.XT plus, RVA Analyser on different raw materials and products.

Compulsory/ Recommended literature, readings (in English):

Approved Methods American Association of Cereal Chemists (AACC)
Bert L. D’Appolonia – Wallace H. Kunerth: The Farinograph Handbook. AACC. USA
Hamed Faridi – Vladimir F. Raspor: The Alveograph Handbook. AACC. USA
Official Methods of Analysis of AOAC International
Vladimir F. Raspor – Ken R. Preston: The Extensigraph Handbook. AACC. USA
**Molecular biology**

**Number of classes/week:** 2+2T, 1. semester

*(form of exam: T – terminal exam, P – assessed by semester performance)*

**Course credits:** 5

**Course instructor:** Prof. Dr. Pál Pepó, professor

**Short course description:**

*Theory:*


*Practice:*

Morphological studies on chromosomes, karyotype, karyogram, mitosis, meiosis, application of molecular biological methods in own research. Electrophoresis, separation techniques.

**Compulsory/recommended readings:**


Food quality and safety risk analysis

Number of classes/week: 2+1T, 3. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credit : 3

Course instructor: Dr. Nikolett Czipa, assistant professor

Condition of enrolment for the course: knowledge in microbiology

Short course description:


Compulsory/Recommended literature, readings (in English):

European Food Safety Authority (EFSA): Opinions of Scientific Panels and Units

Jim E. Riviere: Chemical Food Safety: A Scientist's Perspective, BTS (British Toxilogical Society) Newsletter 2004

Traceability in the food chain

Number of classes/week: 2+1P, 4th semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credit: 2
Course instructor: Dr. Ferenc Peles, assistant professor

Short course description:

Compulsory/recommended readings:

Biacs, P.-Solymosi,V.: Traceability in focus – Hungarian Agricultural Research, 16 (3) 17-20 (2007)


CIES (2005) Implementing traceability in the food supply chain CIES, Paris
Analytical and microbiological rapid methods

Number of classes/week: 1+3P, 3. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Credit value: 3

Course instructor: Dr. Erzsébet Karaffa, associate professor; Dr. József Prokisch, associate professor

Short course description:

Transfer of basic knowledge of analytical chemistry, necessary for successful learning of other basic and professional subjects of the educational system. It is an aim of the teaching of the subject that the students gain knowledge of both classic analytical and modern instrumental analytical chemistry and microbiological methods, and after completion of this subject to establish such a level of analytical knowledge of the students, which makes them capable of rapid determination of composition of agricultural products and foodstuffs, and understanding of the analytical results.

Compulsory/recommended readings:


Werner Baltes: Rapid Methods for Analysis of Food and Food Raw Material CRC, 1990)
Ethical and legal issues of biotechnology

Number of classes/week: 2+0 T, 2. semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 2

Course instructor: Dr. Nikolett Czipa, assistant professor

Condition of enrolment for the course:

Short course description:

Genetic modification of crop plants. Effects, ethical, and legal issues.
The topics of this course to be discussed are: the structure of DNA, RNA and proteins. From DNA to proteins. The recombinant DNA technology. Horizontal gene transfer. The role of the transgene, of the promoter and marker gene. Present and future directions of recombinant GMO technology. The anti-sense DNA technology. The terminator technology. PCR. DNA chips. The effect of transformation on the genome. Substantial equivalence. Selection of the GM plants. The events. The risks assessment. The regulation of release of GMOs, laws, EU Directives. The possible environmental and health risks of GMOs. Ethical, social, ethnic and religious issues.

Study material: the CD version of the material used for preparing the lectures.

Recommended reading: internet searches,

Paul B. Thompson: Food Biotechnology in Ethical Perspective (The International Library of Environmental, Agricultural and Food Ethics) Springer, 2007


Jeffry Smith: Seeds of deception,

William Engdal: Seeds of disruption
Logistics in food chain

Number of classes/week: 2+0T, 4. semester
(form of exam: T – terminal exam, P – assessed by semester performance)
Course credits: 2
Course instructor: Dr. Miklós Pakurár, associate professor

Condition of enrolment for the course: -

Short course description:

The concept and the significance of logistics, the rules of product- and stock-register. Logistic equipments used in food production, profession-specific techniques, logistical system design. Packaging, distributing fundamentals, quality assurance systems of purchasing and supply chain.

Compulsory/recommended readings:

Donald Bowersox, David Closs, M. Bixby Cooper: Supply Chain Logistics Management
ISBN: 0-07-235100-4
Robert M. Monczka, Robert J. Trent, Robert B. Handfield: Purchasing and Supply Chain,
ISBN: 0-324-02315-4
Environmental aspects of food processing

Number of classes/week: 3+0 T, 2. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 3

Course instructor: Prof. Dr. János Tamás, professor

Short course description:


Compulsory/ Recommended literature, readings (in English):

Compulsory

Recommended
Food industry management and economics

Number of classes/week: 2+24T; 4 semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 4

Course instructor: Ferenc Buzas PhD

Short course description:

The students have to familiarize with the system of processing, storage and conservation of agricultural products in the given economic environment. Organisation and public administration of the food industry and the selected sub-branch. Presentation of some important food-chains from several sub-branches. The privatisation of food industry and its effects on Hungarian agribusiness. The key issues of EU joining. The situation, regulation and competitiveness of the EU food industry. The connections of market regulation and the subsidy system. The basis of food-industry marketing.

Compulsory/Recommended literature, readings (in English) - detailed:

Books (available on internet):

Economics and Management of Food Processing by W. Smith Greig. Westport AVI, 1984

Economics of Food Processing in the United States by Chester O. McCorkle (Editor)


Competitiveness in the food industry. W. Bruce Trail and Eamonn Pitts. Blackie Academic & Professional

Product and Process Innovation in the Food Industry Edited by W. Bruce Trail and K.G.Grunert

Food industries Manual by M.D. Ranken R.C. Kill, C.G.J. Baker

Recommended internet sites:

http://www.cee-foodindustry.com/

http://ec.europa.eu/agriculture/

http://www.foodnavigator.com/

http://atn-riae.agr.ca/

http://www.ers.usda.gov/

http://www.foodanddrinkeurope.com/
Packaging technology

Number of classes/week: 2+0P; 1 semester
(form of exam: P-assessed by semester performance)

Course credits: 2

Course instructor: Dr. Diána Ungai, assistant lecturer

Condition of enrolment for the course:

Short course description:

Packaging material types (textile, wood, glass, paper and plastics) and the possibilities of combinations, associations. Quality and reliability of packaging. Packaging machines and tools. Environmental effects of packaging materials, re-use, re-cycling, re-filling. Diffusion and migration of packaging materials in contact with foodstuffs. Labelling of food articles. Mandatory and voluntary labelling, diractions for use, advertisments.

Compulsory/ Recommended literature, readings (in English) - detailed:


J.M. Vergnaud - I. D. Rosca : Assessing Food Safety of Polymer Packaging
Smithers Rapra Technology, 2006
**Healthy Nutrition**

**Number of classes/week:** 1+1T; 1 semester

*(form of exam: T – terminal exam, P – assessed by semester performance)*

**Course credits:** 2

**Course instructor:** Dr. Rita Erdeiné Kremper, assistant professor

**Condition of enrolment for the course:**

**Short course description:**

The topics of this course to be discussed are: Food and disease. The Western diet. The connection between western diet and “civilisation” diseases. Environmental factors: water, air, and the soil. Changes of dietary habits during human evolution. Do we need carbohydrates? The sources and production methods of fats. The vitamin and mineral requirement of the body at different ages. The example of healthy food: the Mediterranean diet. Vegetarianism. The effect of alcohol and drugs on the body. Food allergy and cross-allergens. The effects of different food production methods on the nutritional value of food. The effects of the different food production methods (freeze-drying, micro-waving, freezing, soaking, steaming, boiling, cooking, baking, frying, grilling, etc.) on the nutritional value of food. The effects of dieting.

**Compulsory/ Recommended literature, readings (in English) - detailed:**


Study material: the CD version of the material used for preparing the lectures.

Internet searches. Any human nutrition text book
**Extension knowledges**

**Number of classes/week:** 3+0T, 1. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

**Course credits:** 2

**Course instructor:** Dr. habil Károly Pető, associate professor

**Condition of enrolment for the course:**

**Short course description:**

The objectives and definitions of agricultural extension. The agricultural extension’s role in rural development. The history and development of agricultural extension. The policy of extension. The structure of the extension system. Strategic methods of the extension. The functions of employees working in the field of extension. The role of model farms in the system based on knowledge and information. Evaluating the agricultural system based on knowledge and information. The process of the adaptation and spread of innovations. The phases of the adaptation process. Factors influencing the spread of innovations. The personal characteristics of the advisors. The Hungarian agricultural extension.

Knowledge representation. Techniques of knowledge transmission. The definition and process of communication. The successful communication. The features of individual communication methods in the extension. Visiting farms, as an extension method. The features of knowledge transmission in groups in the extension. Presentation, as an extension method. Organizing exhibitions. Planning group meetings, starting a debate. Writing, as communication in the extension. Using mass-communication channels in the extension. Organizing courses. Using educational aids/tools in the communication.

**Compulsory/ Recommended literature, readings (in English):**


Medicinal plants and their processing

Number of classes/week: 1+3P, 2. semester
(form of exam: T – terminal exam, P – assessed by semester performance)
Course credits: 2
Course instructor: Dr. Erika Kutasy, assistant professor
Condition of enrolment for the course: -

Short course description:

Historical review and importance of medicinal herbs growing in the World and Hungary. Different drugs from medicinal plants, active ingredients, botanical grouping, applications. Agroecological, biological-genetic, and agrotechnical factors in the crop management models of medicinal plants. The most important annual and perennial medicinal plants (general and specific crop management conditions and agrotechnical demands). The primer processing technologies of medicinal plants (drying, extraction methods etc). The quality of medicinal plants and its modifying ecological, genetical and agrotechnical factors. Biotechnology in medicinal crops. New future issues and challenges in medicinal crop production.

Compulsory/ Recommended literature, readings (in English):

Compulsory literature:

Hyderguda and Hyderdad: Cultivation of medicinal and aromatic crops. Univ. Press. 2001
Comparative human and animal nutrition

Number of classes/week: 2+1 T, 2. semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 3

Course instructor: Dr. Judit Remenyik, associate professor; Dr. Péter Bársény, assistant professor

Condition of enrolment for the course:

Short course description: The most important goal of the study to introduce the similarity and differences between the human and (monogastric) animal nutrition, as well as the potential valuation and utilization of the common used foods and feeds either originated from plants, animals or industry.

Compulsory/ Recommended literature, readings (in English):

Animal nutrition / Mcdonald, Peter - London: Longman, 1988
Quality control of biological bases

Number of classes/week: 2+0T, 2. semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 3

Course instructor: Prof. Dr. Péter Pepó, professor; Prof. Dr. István Komlósi, professor

Short course description:


Clean-bred animal breeding, system of variety registration, crossing methods, hybrids, organizations of animal breeding. Performance testing codes of sheep, pig, cattle, horse, poultry. Certification of different animal species, carriage testing systems, operative regulation of quality.


Compulsory/recommended readings:


Basra: Handbook Of Seed Science And Technology (Seed Biology, Production, and Technology). Food Products Press, 2006

Black-Bewley: Seed Technology and Its Biological Basis (Sheffield Biological Sciences). Blackwell, 2000


Biochemical bases of products’ quality

Number of classes/week: 2+0T, 2. semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 2

Course instructor: Dr. Imre Vágó, associate professor

Condition of enrolment for the course: basic knowledge in organic chemistry

Short course description:
Enzymes, hormones. Quality determining protein, carbohydrate, lipid and vitamin content. Intermediate metabolism of these molecules and influencing factors. Natural antioxidants and their role.

Compulsory/Recommended literature, readings (in English):

Biosensors in food analysis

Number of classes/week: 1+0T, 3. Semester

(form of exam: T – terminal exam, P – assessed by semester performance)

Credits: 2

Course instructor: Dr. József Prokisch, associate professor

Description of store of learning:

Category of biosensors, fundamental principle
Advantages of biosensors over other conventional instrumental techniques
Biosensor construction and design
Sensitivity and selectivity of biologically active components applied in biosensors: enzymes, antigens, antibodies, vegetable and animal tissues.
Biosensor applications in food industry
Alcohol content determination of wines, beers and other alcoholic liquors
Carbohydrate and amine analysis with biosensor use
Investigation of special food components (polyphenols, antioxidants) with biosensors
Immunosensors for mycotoxins in foods
Third generation of biosensors and their applications
Prospects in detection method development

Compulsory/ Recommended literature, readings (in English):


Food safety assessment of agrochemicals

Number of classes/week: 2+0T, 3. semester
(form of exam: T – terminal exam, P – assessed by semester performance)

Course credits: 2

Course instructor: Dr. Judit Remenyik, associate professor

Condition of enrolment for the course: basic knowledge in organic chemistry

Short course description:

Compulsory/Recommended literature, readings (in English):


Tadeo J.L. (ed), Analysis of Pesticides in Food and Environmental Samples, CRC Press 2008


**Quality evaluation of food proteins**

Number of classes/week: 2+0T, 4. semester

Credit value: 2

(form of exam: T – terminal exam, P – assessed by semester performance)

Course instructor: Dr. Judit Remenyik, associate professor

Description of material of knowledge to be acquired within the framework of the subject:

Efficient management of the proteins, the better utilization level requires that students of agricultural universities are fully aware of the quality evaluation of proteins, and of the practical utilization of protein analysis results. Quality evaluation of proteins in order to produce foods and feeding stuffs with optimal protein contents is a very time-consuming and hard work, but, nowadays an almost indispensable task. This is worth the efforts, however, since its economic effect appears in almost every field of the agriculture. Thus, the aim of teaching of the subject is to introduce the students to protein evaluation methods, both to ones used in the past and to those that are currently being in use.

**Compulsory/ Recommended literature, readings (in English):**

